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Objective

*To provide a dynamic teaching and research environment in
RF Photonics, Adaptive Signal Processing, and Opto-electronics*

I. Professional Education

University of Colorado – Boulder, CO

Doctor of Philosophy in Electrical Engineering (August, 2003)

Thesis: Coherent Optical Signal Processing for Broadband Adaptive
Phased-Array Antennas using the BEAMTAP Algorithm

Master of Science in Electrical Engineering (December, 1999)

Rose-Hulman Institute of Technology – Terre Haute, IN

Bachelor of Science in Physics and Applied Optics (May, 1997)

II. Appointments

California State University, Fresno – Fresno, CA

01/09 - date **Honors College Director** for the College of Engineering

Responsible for: Directing and coordinating the College of Engineering's Honors Program; Chair of the COE Honors College Committee; leading marketing and recruitment efforts; coordinating procedures for admission or denial of applicants; providing seminar courses for Honors College recipients; coordinating efforts with students in Academic Excellence, Leadership, and Professional Service; providing honors student advising; maintaining records and tracking of students; leading honors program planning and curriculum development; coordinating program reviews and assessment.

California State University, Fresno – Fresno, CA

08/07 - 08/08 **Graduate Coordinator** for the M.S. in Engineering – Electrical Option

Responsible for: Directing and coordinating the graduate program; leading marketing and recruitment efforts; coordinating procedures for admission or denial of graduate program applicants; providing initial graduate student advising; maintaining departmental graduate student records and tracks all students in the program; handling graduate student petitions and appeals; leading graduate program planning and curriculum development; coordinating program reviews and assessment.

08/03 - date **Assistant Professor** in Electrical and Computer Engineering

Engaged in Graduate and Undergraduate teaching, the development of new lecture and laboratory coursework, and the implementation of current design tools and methodologies in Electrical and Computer Engineering; involved in research and scholarly activities in optical signal processing, optical communication, and opto-electronics; responsible for supervising student projects and research at both the graduate and undergraduate level.

University of Colorado, Boulder – Boulder, CO

07/04 - 08/04 **Visiting Assistant Professor** in Electrical Engineering

Collaborated with researchers in opto-electronics; worked on coherent optical array processing and other activities related to RF photonics, including photon echo optical processing; performed duties and responsibilities in my area of expertise as assigned by the University of Colorado and the Electrical and Computer Engineering Department; co-wrote a number of papers, in addition to a proposal to the National Reconnaissance Office.

01/98 - 08/03 **Graduate Research Assistant** in Electrical Engineering

Studied algorithms, architectures, and systems involving optical processing of RF phased-array antennas; analyzed and experimentally demonstrated an adaptive photonic phased-array processor using acousto-optics, a traveling-fringes detector, and a photorefractive crystal to form a squint-free beam toward a broadband signal of interest and simultaneously null broadband jamming signals.

Toyon Research Corporation – Santa Barbara, CA

05/08 - date **Consultant**

Responsible for exploring the applicability of optical signal processing techniques for RADAR applications using phased-array antennas.

III. Assigned Time by Semester

Assigned time duties are broken down by semester – also included the type and number for each class, the course name, enrollment, and whether the class involves web-based instruction, web-assisted instruction, and/or distance learning.

Several Notes:

ECE = Electrical and Computer Engineering EE = Electrical Engineering (Graduate)

Web-Based = Internet- and computer-based content/tools constitute a major portion of the class.

Web-Assisted = Internet- and computer-based content/tools are used to assist teaching the class.

Table 1: Fall 2008

Type/Number	Course Name	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 1 (2)*	Introduction to ECE	67	Y	Y	N
ECE 1L (4)**	Introduction to ECE Lab	67	Y	Y	N
ECE 124 [†]	Signals and Systems	31	N	Y	N
ECE 290	Independent Study	2	N	N	N
ECE 298	Graduate Project	2	N	N	N

3 Units of Release Time were assigned to the Provost's Research Activity Award (RAA).

*Teaching 2 Sections of ECE 1. **Teaching 4 Sections of ECE 1L. † ECE 124 is a 4 unit course.

Table 2: Spring 2008

Type/Number	Course Name	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 1 (1)*	Introduction to ECE	26	Y	Y	N
ECE 1L (2)**	Introduction to ECE Lab	26	Y	Y	N
ECE 186B	Senior Design II	11	N	Y	N
ECE 190	Undergrad. Independent Study	1	N	N	N
ECE 290	Graduate Independent Study	1	N	N	N

3 Units of Release Time were assigned to Graduate Coordinator responsibilities.

3 Units of Release Time were assigned to Graduate Faculty/Program Enhancement

*Teaching 1 Section of ECE 1. **Teaching 2 Sections of ECE 1L.

Table 3: Fall 2007

Type/Number	Course Name	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 1 (2)*	Introduction to ECE	64	Y	Y	N
ECE 1L (4)**	Introduction to ECE Lab	64	Y	Y	N
ECE/EE 191T/291T	Optical Systems	3	N	Y	N
ECE 186A	Senior Design I	8	N	Y	N

3 Units of Release Time were assigned to Graduate Coordinator responsibilities.

*Teaching 2 Sections of ECE 1. **Teaching 4 Sections of ECE 1L.

Table 4: Spring 2007

Type/Number	Course Name	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 1	Introduction to ECE	22	Y	Y	N
ECE 1L	Introduction to ECE Lab	22	Y	Y	N
ECE 120L	Computer Systems Laboratory	16	N	Y	N
EE 257	Optical Comm. & Lasers	6	N	Y	N
EE 298	Graduate Project	2	N	N	N

3 Units of Release Time were provided by a Graduate Faculty/Program Enhancement Award.

Table 5: Fall 2006

Type/Number	Course Name	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 1 (2)*	Introduction to ECE	68	Y	Y	N
ECE 1L (4)**	Introduction to ECE Lab	68	Y	Y	N
ECE 120L	Computer Systems Laboratory	17	N	Y	N
ECE 186B	Senior Design II	12	N	Y	N
EE 290	Independent Study (Graduate)	2	N	N	N

*Teaching 2 Sections of ECE 1. **Teaching 4 Sections of ECE 1L.

Table 6: Spring 2006

Type/Number	Course Name	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 120L	Computer Systems Laboratory	18	N	Y	N
ECE 171	Quantum Electronics	10	N	Y	N
ECE 186A	Senior Design I	12	N	Y	N
EE 245	Communications Engineering	16	N	Y	N
EE 290	Independent Study (Graduate)	3	N	N	N
EE 298	Project (Graduate)	1	N	N	N

2 Units of release time were provided for ABET preparation.

Table 7: Fall 2005

Type/Number	Course Name	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 85	Digital Logic Design	77	N	Y	N
ECE 120L	Computer Systems Laboratory	19	N	Y	Y
ECE 186B	Senior Design II	9	N	Y	Y

3 Units of Release time were provided by the Provost Award 2005.

1 Unit of Release time was provided to help with ABET preparation.

Table 8: Spring 2005

Type/Number	Course Name	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 1	Introduction to ECE	25	N	Y	N
ECE 85	Digital Logic Design	60	N	Y	N
ECE 120L	Computer Systems Laboratory	13	N	Y	N
ECE 186A	Senior Design I	9	N	Y	Y
ECE 190	Independent Study	1	N	N	N
EE 257	Optical Com. and Lasers	5	N	N	Y

Table 9: Fall 2004

Type/Number	Course Name	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 71	Engineering Comp. in C	39	Y	Y	N
ECE 85	Digital Logic Design	68	N	Y	N
ECE 90	Principles of Electrical Circuits	32	N	Y	N
ECE 90L	Prin. of Electrical Circuits Lab	8	N	Y	N

Table 10: Spring 2004

Type/Number	Course Name	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 85	Digital Logic Design	44	N	Y	N
ECE 90	Prin. of Electrical Circuits Lab	17	N	N	N
ECE 120L	Computer Systems Lab	18	N	Y	N

3 Units of release time were provided, as it was my first probationary year.

1 Unit of release time was provided to help with ABET preparation.

Table 11: Fall 2003

Type/Number	Course Name	Enrollment	Web-Based	Web-Assist	Dist. Learn.
ECE 71	Engineering Comp. in C	32	Y	Y	N
ECE 85	Digital Logic Design	33	N	Y	Y
EE 257	Optical Com. and Lasers	5	N	N	N

*3 Units of release time were provided, as it was my first probationary year.

IV. Teaching Experience

California State University – Fresno, CA

08/03 - date **Graduate Courses Taught**

EE 245 – Communications Engineering
 EE 257 – Optical Communication and Lasers
 EE 290 – Independent Study
 EE 291T – Optical Systems
 EE 298 – Project

08/03 - date **Undergraduate Courses Taught**

ECE 1 – Introduction to Electrical and Computer Engineering
 ECE 71 – Engineering Computations in C
 ECE 85 – Digital Logic Design
 ECE 90 – Principles of Electrical Circuits
 ECE 90L – Principles of Electrical Circuits Lab
 ECE 120L – Digital Systems Laboratory
 ECE 124 – Signals and Systems
 ECE 171 – Quantum Electronics
 ECE 186A – Senior Design I
 ECE 186B – Senior Design II
 ECE 190 – Independent Study
 ECE 191T – Optical Systems

All teaching experience at California State University, Fresno has occurred as an Assistant Professor, between 08/03 - date.

University of Colorado – Boulder, CO

08/97 - 07/03 **Graduate Courses Taught**

ECEN 5016 – Fundamentals of Photonics*
 ECEN 5385 – Optical Properties of Materials*
 ECEN 5606 – Advanced Optics Lab[†]
 ECEN 6156 – Physical Optics*

08/97 - 07/03 **Undergraduate Courses Taught**

ECEN 4006 – Undergraduate Optics Lab[†]

*Taught as a Guest Lecturer (1 - 4 class periods)

[†]Taught as a Co-Teaching Assistant (2 semesters)

‡Taught as a Full Teaching Assistant (1 semester)

All teaching experience as the University of Colorado, Boulder has occurred either as a Graduate Research Assistant or as a Teaching Assistant, between 08/97 - 08/03.

V. Research Experience

Expertise includes: Lasers, Optics, Acousto-Optics, Photorefractives, Dynamic Holography, Opto-Electronics and Electro-Optics, Optical Systems and Integration, Opto-Electronic Feedback Systems, Electronics, Filter Design, and RF and Microwave Circuit Design.

Grants Awarded:

Edwards Air Force Base 2008

Unmanned Aerial Vehicle

Research Activity Award (RAA) 2008

BEAMTAP Proposal for Adaptive Antenna Array Processing

Enhancing Learning and Teaching 2008

Interdisciplinary Innovation Teams in Anthropology, Engineering, and Entrepreneurship

Graduate Faculty/Program Enhancement 2008

Graduate Research

Edward's Air Force Base 2007

Optical Communications Laboratory Development (2)

Graduate Faculty/Program Enhancement Award 2007

Optical Systems Course/Laboratory Development

Edward's Air Force Base/Knowledge Workers 2006

Multi-Channel Fiber-Optic Communication Link

Grant Writing Investment

Colorado Photonics, Inc. 2005

Equipment Grant/Donation for the Optical Communications Laboratory

Edward's Air Force Base/Knowledge Workers 2005

Design of a Compass 315M Laser Control Panel

Free-space Opto-electronic Communication Link

Provost's Award 2005

Polarization-Angle, Read-Write Multiplexing for Wide-Angular Aperture Holography

Faculty Development 2004

Theoretical Optimization of Polarization-Angle, Read-Write Multiplexing for
Dynamic Holography

2, Coherent 315M-100 Green DPSS Laser Systems

Contracts Awarded:

Pelco 2005

Optical Free-Space Communication System for Video Signals

Phase 1 Funding, Spring 2005

Phase 2 Funding, Fall 2005

Scholarships Awarded:

Provost's Graduate Scholarships 2008

Graduate Scholarships Awarded to New Graduate Students

Private Contracts & Consulting:

Toyon Research Corporation 2008

BEAMTAP White Paper & Phase I Implementation

Laboratory Development:

Provost 2006 Laboratory Supplement to College of Engineering

Optical Communications Laboratory

Developed undergraduate and graduate optical lab experiments

Introduction to Electrical and Computer Engineering

Developed a new Robotics lab for incoming Freshman ECE students

Departmental Curriculum Development

Introduction to Electrical Circuits Laboratory

Re-wrote lab manual and incorporated new lab experiments

Digital Systems Laboratory

Co-wrote lab manual and incorporated new lab experiments

California State University – Fresno, CA

08/03 - date **Graduate Level Research & Projects**

Unmanned Aerial Vehicle

This research seeks to develop an Unmanned Aerial Vehicle (UAV) for Edwards Air Force Base capable of targeting a ground based object with a laser. The UAV will provide video surveillance of the target and surrounding area, and will incorporate GPS, gyroscope, accelerometer, and vibrational sensors. Project goals include the education of graduate and undergraduate students, providing professional development opportunities for high school educators and students, and providing enhanced laboratory development capabilities for California State University, Fresno.

64 Tri-Color LED Display with Color Blending

This project developed a 64 tri-color LED display with color blending using a PIC16F microcontroller and Maxim LED shift register drivers onto a PC board. The purpose of the project is to provide an educational experience to undergraduate and graduate students, and to develop a demonstration board that can be used by the Electrical and Computer Engineering Department. The project has been highly successful.

Remote Microcontroller-Based Appliance Controller

This research seeks to develop a remote microcontroller-based appliance controller with a status check and feedback monitoring system. It will also allow for remote access and control of the appliance through cell phone technology, and provide a timing circuit to change the status of the appliance at specific times. The project seeks to blend optical, wireless, and wired communication techniques and technologies.

Polarization-Angle, Read-Write Multiplexing for Wide-Angular Aperture Holography

This research sought to optimize the geometry for simultaneous reading and writing of holographic information within an anisotropic photorefractive crystal, where the optical reading and writing beams contain a wide angular aperture and are orthogonally polarized. The work was based upon the equal-curvature, parallel-tangents condition, which can be used for holographic data storage and radio frequency (RF) signal processing.

Fiber-Optic Communication and Multiplexing Link

This research project seeks to create a fiber-optic communications link using time-division multiplexing through the use of fiber-optic laser-diode transceivers and several kilometers of fiber optic cable. Interface with the fiber-optic transceivers is being performed digitally using a PCB layout for pre- and post-amplification, analog-to-digital and digital-to-analog conversion, and timing circuits using PIC microcontrollers. The goal is to complete a complete end-to-end fiber-optic link using multiple channels.

Optical Free-Space Communication System for Video Signals

This research project created an optical free-space communication system for video signals in conjunction with Pelco. Phase I funding was provided in Fall 2005 for an initial proof of concept of the system, followed by Phase II funding to field a prototype starting Spring 2005. All optical design and implementation for the research was performed at California State University, Fresno, with Pelco providing electronic expertise and manufacturing capabilities.

Digital Image Processing

This project investigated several common techniques for manipulating digital images in the spatial and spatial frequency domains. Techniques such as conversion from color mode to gray mode, adjustment of brightness, creation of threshold images, addition of random noise, application of median filters, generation of histograms, application of contrast stretching, and application of spatial filters were implemented. In addition, Fourier Transform techniques were used to smooth and sharpen images.

Free-space Opto-electronic Communication Link for Audio Signals

This graduate class research project was designed to instruct graduate students about engineering research methodologies, including examination of the theoretical background of a system, specification of components and their parameters, cost analysis and purchasing, experimentation, integration, debugging, and analysis of experimental results. In the process, a free-space, opto-electronic communication link was designed and implemented.

08/03 - date **Undergraduate Level Research**

Design of a Compass 315M Laser Control Panel

This research seeks to design the interface electronics to a Coherent analog controller for the 315M laser head using a PCB layout, and includes fault indicators as well as the initialization logic for the laser head. The initialization logic will indicate when the laser has stabilized, the selected power level has been achieved and locked in, and will provide an LCD display indicating the current operating power of the laser. The control panel will also monitor the laser diode current and current control voltage, as necessary.

Fiber Optic Communication Link

Using industrial fiber optic telecommunication equipment (optical transmitters, fiber, couplers, attenuators, splitters, transceivers, and receivers) a fiber optic communication link will be designed involving time-division multiplexing for eight data channels.

Linux RAID Server

Logical Volume Management and a RAID system (Random Array of Inexpensive Disks) was studied for a Linux server employing the use of NFS and Samba for both Linux and Windows file systems.

08/03 - date **Completed Senior Design Projects**

2008 Senior Projects

The Wait Mate E-Team Project*

Wireless Restaurant Pager System

*2nd Place in the Business Plan Competition at InterProfessional Projects Day (IPRO) Competition

Speech Enhancement Headphones*

Speech Enhancement Headphones using the LMS Algorithm

*1st Place in the College of Engineering's Senior Project Day Competition

Force Feedback with Motor Controls

Force Feedback with Motor Control

VARC E-Team Project*

Voice Activated Remote Control

*1st Place in the Spring 2008 IEEE Region 6 Design Competition

Autonomous Thermal Imaging Flight System

Autonomous Thermal Imaging Flight System*

*3rd Place in the College of Engineering's Senior Project Day Competition

2006 Senior Projects

Database-Driven Online Application System*

Secure Online Application System for the Nursing Department

*Now being implemented within multiple California State Universities

Digital Audio Multiplexer

Fiber-Optic Digital Audio Multiplexer

Four-Wheel Drive Traction Control

Digital Four-Wheel Drive Traction Control System with Feedback

Surround Sound Monitor

Digital Surround Sound Meter using a BLACKfin DSP Processor

Traffic Light Controller

Traffic Light Controller with Emergency Override

2005 Senior Projects

Embedded Sensor, Ethernet-Based Greenhouse

Ethernet-Based Embedded Systems Environment for a Greenhouse

Redesigning the Hero 1 Robot

Redesign of the Hero 1 Robot for Autonomous Movement

Tactile Remote Steering

Tactile Remote Steering with Force Feedback Control

Tracking Objects with Sensors

Remote Sensing and Tracking with Acoustics and Video

University of Colorado – Boulder, CO

01/98 - 08/03 **Graduate Research Assistant**

Novel Contributions:

- Experimentally demonstrated simultaneous adaptive beam forming and jammer nulling for large fractional bandwidth RF signals at 1 GHz center frequencies using optical signal processing and the BEAMTAP algorithm.
- Designed and implemented a unique phase stabilization system for cohering the phase of the optical beams in the BEAMTAP system.
- Implemented a photorefractive wide-angular aperture, polarization-angle multiplexing scheme in BaTiO₃ for read-write isolation of the diffracted hologram.
- Corrected theory to the parallel-tangents, equal-curvature condition for wide-angular aperture diffracted readout in BaTiO₃.
- Experimentally demonstrated broadband electron and hole detection with a traveling-fringes detector employing inherent time delay.

- Experimentally demonstrated 50% fractional bandwidth impedance matching at 1 GHz using a transimpedance amplifier, hybrid coupler, and microstrip design.

Rose-Hulman Institute of Technology – Terre Haute, IN

Applied Optics Laboratory Research

- 08/96 - 10/96 Built a 4f Fourier transform optical processor using holographic transmission gratings as focusing elements. Studied diffraction efficiency, magnification, resolution, and aberrations. Demonstrated simple optical image processing.
- 03/96 - 06/96 Built a monochromator using a transmission grating and achromatic lenses as collimating and focusing elements. Analysis of the accuracy, efficiency, angular dispersion, linear dispersion, and resolving power were provided.

Undergraduate Researcher

- 12/95 - 02/96 Researched the theoretical background and principles of fiber-optic gyroscopes. Performed experimental work using fiber optics.
- 03/95 - 06/95

VI. Additional Educational/Research Experience

University of Colorado – Boulder, CO (ECE & Physics Departments)

Optical Properties of Materials

Study of superlattices, minibands, and strained superlattice structures.

Semiconductor Materials and Devices

Review of work on modeling of the optical properties of MQW modulators in InGaAsP.

RF/Optical Techniques

Optical and microwave comparison of 1-D spatial and temporal soliton propagation.

Radar and Remote Sensing

Design of a simple radar system to detect cloud heights.

Optoelectronic System Design

Design of a three-element zoom lens system.

Laser Physics

Study of Diode-pumped frequency doubled CW Nd:YVO₄ lasers.

Fourier Optics

Beam propagation of an RF single-sideband modulated optical signal through a 4f system.

Photorefractive Materials

Gain and stability analysis of a photorefractive circuit.

VII. Fellowships/Scholarships

1999 - 2002 National Defense Science and Engineering Graduate Fellowship

The NDSEG Fellowship Program is a joint program of the United States Army, Navy, and Air Force within the University Research Initiative (URI), designed to increase the number of U. S. citizens trained in the disciplines of science and engineering important to defense goals.

- 1997 - 1998 **University of Colorado Fellowship**
One year graduate fellowship awarded for excellence in undergraduate studies by the University of Colorado for a select number of incoming first year graduate students.
- 1995 - 1996 **Rose-Hulman Presidential Scholarship**
Undergraduate scholarship awarded by the president for excellence in course work with respect to the other engineering students attending Rose-Hulman.
- 1993 - 1994 **Rose-Hulman Scholarship**
Undergraduate scholarship awarded by Rose-Hulman for excellence in course work with respect to other engineering students.

VIII. Academic Honors

- Spring 2008 **Certificate of Recognition for Outstanding Student Advisor**
This award is given by the IEEE student branch at California State University, Fresno for exemplary hard work and outstanding dedication to the student body as branch counselor.
- Fall 2007 **Provost's Award for Excellence in Teaching and Scholarship**
This award is given by the Provost to recognize outstanding performance in Teaching and Scholarship Activities.
- Summer 2007 **Nominated for the Mac Van Valkenburg Early Career Teaching Award**
The purpose of this award is to recognize members of the IEEE Education Society who have made outstanding contributions to teaching unusually early in their professional careers.
- 2006 - 2007 **Featured on the 2006 - 2007 Academic Calendar**
The purpose of the calendar was to highlight :some of our outstanding faculty who are making significant contributions to students by including them in their research projects”.
- Spring 2006 **Nominated for the Promising New Faculty Award**
The purpose of this award is to recognize exemplary achievements in teaching, research/creative activities and/or service among all non-tenured, tenure track faculty.
- Spring 1997 **Gene M. Bennett Award for Excellence in Applied Optics**
This award is given to the best senior undergraduate student in Applied Optics as determined by the faculty of the Department of Physics and Applied Optics each year. Only one award is given per year.
- Spring 1997 **Paul N. Bogart Scholar**
This award is given to the senior undergraduate student(s) with the highest cumulative GPA at the end of their undergraduate career.
- Spring 1997 **Sigma Pi Sigma Physics Honorary**

This award is bestowed upon physics and applied optics students who have maintained a high degree of excellence in their undergraduate physics/applied optics courses as an undergraduate.

Spring 1996 **Heminway Scholar**

This award is given to the junior undergraduate student(s) who have maintained the highest cumulative GPA at the end of three years.

1993 - 1997 **Rose-Hulman Honor's List 12/12 Quarters**

A student who is enrolled for at least 45 graded hours in a given academic year and who completes that year with a grade point average of 3.300 or more shall be awarded Class Honors for that year.

IX. Computer Skills

Operating Systems:	Linux System Administration, Linux (RedHat, Fedora Core, Fedora), Unix, Windows, DOS
Programming Languages:	C, Assembly, Perl, HTML, PHP, Pascal, PBASIC, IDL, Matlab, Maple, Mathematica
Typesetting/Other Programs:	Emacs, Latex, Open Office, Microsoft Office; Apache, dovecot, Enlightenment, fetchmail, Joomla, phpBB, MediaWiki, MySQL, NFS, rsync, Samba, sendmail, spambayes, etc.

X. Professional Society Activities

IEEE Member – The Institute of Electrical and Electronics Engineers

Advisor for the IEEE Student Chapter – California State University, Fresno

OSA Member – The Optical Society of America

SPIE Member – The International Society for Optical Engineering

SPIE Advisor for High School Teachers – Fresno District

Editor for John Wiley & Sons, Inc. – “The Handbook of Computer Networks”

Book Chapter – Optical Solitons

XI. Refereed Publications

Book Chapters

1. G. R. Kriehn and K. Wagner, “True-time-delay adaptive array processing using photorefractive crystals,” *Photorefractive Materials and Applications (Vol. III)*, 2006.*

*Invited Book Chapter, submitted (and accepted) to *Springer Series in Optical Sciences: Photorefractive Materials and Applications (Vol. III)* in April 2004 for publication in 2006.

Journal Publications

1. M. Colice, R. T. Weverka, G. Kriehn, F. Schlottau, and K. Wagner, “Holographic Method of Cohering Fiber Tapped-Delay-Lines,” *Applied Optics* **44**, pp. 5257-5272, September 2005.

2. A. Kiruluta, G. S. Pati, G. Kriehn, P. E. X. Silveira, A. W. Sarto, and K. Wagner, "Spatio-temporal operator formalism for holographic recording and diffraction in a photorefractive-based true-time-delay phased-array processor," *Applied Optics* **42**, pp. 5334-5350, September 2003.[†]
3. G. Kriehn, A. Kiruluta, P. E. X. Silveira, S. Weaver, S. Kraut, K. Wagner, R. T. Weverka, and L. Griffiths, "Optical BEAMTAP beam-forming and jammer-nulling system for broadband phased-array antennas," *Applied Optics* **39**, pp. 212-230, January 2000.[†]

[†]Featured on the cover of *Applied Optics*.

Conference Publications

1. G. Kriehn and K. Wagner, "Photorefractive-Based Adaptive Antenna Array Processing using BEAMTAP," In *Controlling Light with Light: Photorefractive Effects, Photosensitivity, Fiber Gratings, Photonic Materials and More (PR)*, OSA, October 2007.
2. G. R. Kriehn and K. Wagner, "Experimental Demonstration of a Broadband Adaptive Processor for Phased-Array Antennas," In *Optical Information Systems II*, SPIE, August 2004.
3. C. M. Colice, T. Weverka, G. R. Kriehn, K. H. Wagner, "Coherent fiber-remoting using phase-cohering holography," In *Photorefractive Fiber and Crystal Devices: Materials, Optical Properties, and Applications IX*, SPIE, August 2004.
4. G. Kriehn, F. Schlottau, and K. Wagner, "Optically-Implemented 2-D Beam Steering and Jammer Nulling using BEAMTAP," In *Optical Computing*, SPIE, (Taipei, Taiwan) April 2002.
5. Kelvin H. Wagner, Greg Kriehn, and Friso Schlottau, "Wideband All-Optical BEAMTAP," In *The International Topical Meeting on Microwave Photonics*, IEEE, October, 2001.
6. G. Kriehn and K. Wagner, "Experimental Adaptive Beam Forming with Polarization Read-Write Multiplexing using BEAMTAP," In *The International Topical Meeting on Microwave Photonics*, IEEE, October, 2001.
7. G. Kriehn, F. Schlottau, G. S. Pati, and K. Wagner, "Demonstration of RF Photonic Beam Forming using the BEAMTAP Algorithm," In *Optical Computing*, SPIE, January 2001.
8. G. Kriehn, G. S. Pati, P. E. X. Silveira, F. Schlottau, and K. Wagner and D. Dolfi, "Demonstration of optical beam forming using BEAMTAP," In *International Workshop on Photonics for Antennas*, Invited Paper at The International Topical Meeting on Microwave Photonics MWP 2000, (Oxford, United Kingdom) September, 2000.
9. G. R. Kriehn, P. E. X. Silveira, G. S. Pati, F. Schlottau, and K. H. Wagner, "BEAMTAP RF-photonic adaptive-array processing," In *Interactions between Microwaves and Optics*, OMW 3rd International Summer School, (Autrans, France) August 2000.
10. G. Kriehn, G. S. Pati, P. E. X. Silveira, F. Schlottau, S. Weaver, and K. Wagner, "Experimental demonstration of broadband adaptive beam forming using the BEAMTAP algorithm," In *Proceedings of The Tenth Annual DARPA Symposium on Photonic Systems for Antenna Applications*, PSAA-10, February 2000.

11. G. Kriehn, A. Kiruluta, P. E. X. Silveira, S. Weaver, S. Kraut, K. Wagner, R. T. Weverka, and L. Griffiths, "Optical BEAMTAP beam-forming and jammer-nulling system for broadband phased-array antennas," *Applied Optics* **39**, pp. 212-230, January 2000.
12. K. H. Wagner, G. R. Kriehn, and P. E. X. Silveira, "RF-Photonic Adaptive-Array Processing," In *National Radio Science Meeting*, URSI, p. 238, January 2000.
13. K. H. Wagner, G. R. Kriehn, P. E. X. Silveira, "Photorefractive adaptive phased-array processor," In *LEOS Newsletter*, IEEE Lasers and Electro-Optics Society, pp. 17-18, October 1999.
14. K. H. Wagner, G. R. Kriehn, A. J. M. Kiruluta, and P. E. X. Silveira, "RF-Photonic Adaptive Array Processing," In *COLOQ'6*, Invited Paper at SFO Horizons d'optique, (Bordeaux, France) September 1999.
15. P. E. X. Silveira, G. Kriehn, A. Kiruluta, S. Weaver, K. H. Wagner, and R. T. Weverka, "All-optical antenna array adaptive processing system," In *Radar Processing, Technology, and Applications IV*, Proc. SPIE, **3810** pp. 16-26, July 1999.
16. G. Kriehn, A. M. Kiruluta, K. H. Wagner, D. Dolfi, and J.-P. Huignard, "Detection and time delay of a broadband RF signal using a traveling fringes detector," In *Terahertz and Gigahertz Photonics*, Proc. SPIE, **3795** July 1999.
17. A. Kiruluta, G. Kriehn, P. E. X. Silveira, S. Weaver, and K. Wagner, "Adaptive beamforming with TDI CCD based true-time-delay processing," In *Algorithm, Devices, and Systems for Optical Information Processing III*, Proc. SPIE, **3804** July 1999.
18. K. H. Wagner, G. Kriehn, P. E. X. Silveira, A. Kiruluta, and S. Weaver, "Photorefractive BEAMTAP RF Beamforming System," In *Seventh Topical Meeting on Photorefractive Materials, Effects, and Devices*, OSA, (Elsinor, Denmark) June 1999.
19. A. Kiruluta, G. Kriehn, P. E. X. Silveira, S. Weaver, and K. H. Wagner, "Operator notational analysis of a photorefractive phased array processor," In *Optics in Computing Technical Digest*, OSA, pp. 170-172, April 1999.
20. K. Wagner, A. Kiruluta, G. Kriehn, P. E. X. Silveira, S. Weaver, and T. Weverka, "Photorefractive-based true-time-delay phased array processing," In *Photonics and Phased Array Systems (PAPAS) (SPIE's International Technical Group Newsletter Optical Processing and Computing)*, SPIE, pp. 5,10, April 1999.
21. G. Kriehn, P. E. X. Silveira, K. H. Wagner, A. Kiruluta, and S. Weaver, "All-optical BEAMTAP beamforming system," In *Proceedings of the Ninth Annual DARPA Symposium on Photonic Systems for Antenna Applications*, PSAA-9, February 1999.
22. A. Kiruluta, P. E. X. Silveira, G. Kriehn, S. Weaver, and K. Wagner, "Photorefractive phased array beamforming with true-time-delay processing," In *International Topical Meeting on Microwave Photonics Technical Digest (including High Speed Photonics Components Workshop)*, IEEE, pp. 103-106, October 1998.

23. G. Kriehn, A. Kiruluta, P. E. X. Silveira, S. Weaver, and K. Wagner, "Imaging analysis of photorefractive phased array beamforming," In *Radar Processing, Technology, and Applications III*, Proc. SPIE, pp. 196-208, July 1998.

XII. Professional & Conference Presentations

1. G. Kriehn, "BEAMTAP Technical Interchange Meeting", *Toyon Research Corporation (Goleta, CA)*, October 2008.
2. G. Kriehn, "BEAMTAP Technical Interchange Meeting", *Toyon Research Corporation (FL)*, October 2008.
3. G. Kriehn, "BEAMTAP Technical Interchange Meeting", *Toyon Research Corporation (Goleta, CA)*, August 2008.
4. G. Kriehn, "BEAMTAP Technical Interchange Meeting", *Toyon Research Corporation (Goleta, CA)*, June 2008.
5. G. Kriehn, "BEAMTAP Tutorial", *Toyon Research Corporation (Goleta, CA)*, April 2008.
6. G. Kriehn and K. Wagner, "Photorefractive-Based Adaptive Antenna Array Processing using BEAMTAP," *OSA's Controlling Light with Light: Photorefractive Effects, Photosensitivity, Fiber Gratings, Photonic Materials and More (PR)*, October 2007.
7. G. Kriehn, "Experimental Demonstration of a Broadband Adaptive Processor for Phased-Array Antennas", *Toyon Research Meeting (Boulder, CO)*, May 2007.
8. G. Kriehn, "Video Free-Space Communication Link Part 2", *Pelco (Fresno, CA)*, Summer 2007.
9. G. Kriehn, "Optical Free-Space Communication Link Part 1", *Pelco (Fresno, CA)*, Spring 2007.
10. G. Kriehn, "Optical Free-Space Communication Link", *Pelco (Clovis, CA)*, Summer 2006.
11. G. Kriehn, "Experimental Demonstration of a Broadband Adaptive Processor for Phased-Array Antennas," *IPiTEK (Carlsbad, CA)*, Spring 2006.
12. G. Kriehn and D. Z. Lucka, "Optical Free Space Communication Links", *Pelco (Clovis, CA)*, February 2005.
13. G. Kriehn, R. Nunna, and D. Z. Lucka, "Future Interaction between California State University, Fresno ,and Pelco", with *Pelco (Clovis, CA)*, November 2004.
14. G. Kriehn, "Experimental Demonstration of a Broadband Adaptive Processor for Phased-Array Antennas," *SPIE's 49th Annual Meeting and Exhibition*, August 2004.
15. G. Kriehn, "Coherent Optical Signal Processing using the Traveling-Fringes Detector and the BEAMTAP Algorithm," *University of Colorado, Boulder (Lockheed Meeting)*, July 2004.

16. G. Kriehn, "Coherent Optical Signal Processing for Broadband Phased-Array Antennas using the BEAMTAP Algorithm," *University of Colorado, Boulder (Dr. Kelvin Wagner's Research Group)*, July 2004.
17. G. Kriehn, "Polarization-Angle, Read-Write Multiplexing using Dynamic Holography," *California State University, Fresno (Physics Colloquium)*, February 2004.
18. G. Kriehn, "Coherent Optical Signal Processing for Broadband Phased-Array Antennas using the BEAMTAP Algorithm," *University of Colorado, Boulder (Ph. D. Thesis Defense)*, May 2003.
19. G. Kriehn, "Coherent Opto-Electronic Signal Processing for Broadband, Phased-Array Antennas," *California State University, Fresno*, April 2003.
20. G. Kriehn, "Coherent Optical Signal Processing for Broadband Adaptive Phased-Array Antennas using the BEAMTAP Algorithm," *University of Colorado, Boulder (Ph. D. Comprehensive Exam)*, May 2002.
21. G. Kriehn, F. Schlottau, and K. Wagner, "Optically-Implemented 2-D Beam Steering and Jammer Nulling using BEAMTAP," *Optical Computing*, April 2002.
22. G. Kriehn, F. Schlottau, G. S. Pati, and K. Wagner, "Demonstration of RF Photonic Beam Forming using the BEAMTAP Algorithm," *General Electric Meeting*, November 2001.
23. G. Kriehn, F. Schlottau, G. S. Pati, and K. Wagner, "Demonstration of RF Photonic Beam Forming using the BEAMTAP Algorithm," *Optical Computing*, January 2001.
24. G. Kriehn, F. Schlottau, G. S. Pati, P. E. X. Silveira, and K. Wagner, "Optical BEAMTAP Beam-Forming and Jammer-Nulling System for Broadband Phased-Array Antennas," *Third Annual OSD MURI Review on RF Photonics for Array Processing*, October 2000.
25. G. Kriehn, G. S. Pati, P. E. X. Silveira, F. Schlottau, S. Weaver, and K. Wagner, "Experimental Demonstration of Broadband Adaptive Beam Forming using the BEAMTAP Algorithm," *Tenth Annual DARPA Symposium on Photonic Systems for Antenna Applications*, February 2000.
26. K. H. Wagner, G. R. Kriehn, and P. E. X. Silveira, "RF-Photonic Adaptive-Array Processing," *National Radio Science Meeting*, January 2000.
27. G. Kriehn, P. E. X. Silveira, G. S. Pati, F. Schlottau, S. Weaver, and K. Wagner, "Optical BEAMTAP beam-forming and jammer-nulling system for broadband phased-array antennas," *Second Annual OSD MURI Review on RF Photonics for Array Processing*, December 1999.
28. G. Kriehn, A. Kiruluta, P. E. X. Silveira, S. Weaver, and K. Wagner, "Optical beamforming and jammer nulling system for phased array antennas," *Optoelectronic Computing Systems Center Retreat*, November 1999.

29. A. Kiruluta, G. Kriehn, P. E. X. Silveira, S. Weaver, and K. Wagner, "Adaptive beamforming with TDI CCD based true-time-delay processing," In *SPIE's 44th Annual Meeting and Exhibition*, July 1999.
30. G. Kriehn, A. M. Kiruluta, K. H. Wagner, D. Dolphi, and J.-P. Huignard, "Detection of a broadband RF signal using a traveling fringes detector," *SPIE's 44th Annual Meeting and Exhibition*, July 1999.
31. G. Kriehn, A. Kiruluta, P. E. X. Silveira, S. Weaver, and K. Wagner, "Optical beamforming and jammer nulling system for phased array antennas," *Rose-Hulman Institute of Technology*, May 1999.
32. G. Kriehn, P. E. X. Silveira, K. H. Wagner, A. Kiruluta, and S. Weaver, "All-optical BEAM-TAP beamforming system," *Ninth Annual DARPA Symposium on Photonic Systems for Antenna Applications*, February 1999.
33. G. Kriehn, A. Kiruluta, P. E. X. Silveira, S. Weaver, and K. Wagner, "Efficient optical implementation of broadband squint-free true-time-delay beamforming and jammer nulling," *First Annual OSD MURI Review on RF Photonics for Array Processing*, January 1999.
34. G. Kriehn, A. Kiruluta, S. Weaver, and K. Wagner, "Broadband squint-free true-time-delay beam forming using two tapped delay lines," *1998 OSA Annual Meeting and Exhibit*, October 1998.

XIII. Poster Presentations

1. G. Kriehn and K. Wagner, "Experimental Demonstration of Adaptive Phased-Array Signal Processing," *Colorado Photonics Industry Association*, November 2002.
2. G. Kriehn and K. Wagner, "Experimental Adaptive Beam Forming with Polarization Read-Write Multiplexing using BEAMTAP," In *The International Topical Meeting on Microwave Photonics*, IEEE, October, 2001.
3. G. Kriehn, "Optical Phased Array Signal Processing," *Colorado Photonics Industry Association*, November 2001.
4. G. Kriehn, "Optical Phased Array Signal Processing," *Optoelectronic Computing Systems Center Retreat*, April 2001.
5. G. Kriehn, "Broadband Detection with a Traveling Fringes Detector," *Optoelectronic Computing Systems Center Retreat*, November 1999.
6. G. Kriehn, "Adaptive Array Processing," *Optoelectronic Computing Systems Center Retreat*, 1998.
7. A. Kiruluta, G. Kriehn, P. Silveira, S. Weaver, S. Kraut, and K. Wagner, "Broadband Efficient Adaptive Method for True-Time-Delay Array Processing," In *IEEE International Topical Meeting on Microwave Photonics*, IEEE, (Princeton, NJ), October 1998.

XIV. Non-Refereed Papers/Presentations

1. W. E. Rice and G. Kriehn, "Developing Advisory Teams for Managers," for *World Business Development Conference, India*, 2004.
2. W. E. Rice, S. Geringer, and G. Kriehn, "Pedagogy Revisited: Teaching Style versus Learning Style", for *World Business Development Conference, Thailand*, January 2005.